

Quantitative assessment of endothelial cell response to spatial gradients of VEGF

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Vascular endothelial factor (VEGF) is a key factor in promoting angiogenesis, both in normal vascular reconstruction and pathogenic tumor formation. During this process, endothelial cells respond to spatial cues and transition between quiescent, proliferating, and migrating phenotypes. While it is clear that numerous signaling pathways are triggered by VEGF to elicit these phenotypes, observations from traditional experiments lack the detail required to determine how this information integrates to promote specific phenotypes. We use a novel microfluidic approach to examine endothelial cell behavior in response to well defined VEGF gradients. Here we show a novel methodology for simultaneously collecting quantitative information pertaining to directional sensing and intracellular signaling.